

THE VEGETATION TYPES OF CRATERS OF THE MOON NATIONAL MONUMENT

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INTRODUCTION

The maintenance and perpetuation of park ecosystems are becoming increasingly difficult. Knowledge and understanding of park resources provide keys to their protection. A first step in this process is the development of base-line measures of key resources. In most parks, data on vegetation resources are important base-line components. Beyond providing information on the vegetation composition of a park, such information is also useful in developing fire management plans and delineating wildlife habitat. This report describes the plant communities and presents a vegetation type map (in envelope, back cover) for Craters of the Moon National Monument.

STUDY AREA

Craters of the Moon National Monument (CRMO) is located on the northern edge of the Snake River Plain in southcentral Idaho. The 21,650 ha (53,500 ac) monument encompasses a narrow belt of faults, fissures, cones, and craters called the Great Rift, which extends southeastward through the area. Elevations range from 1625 m (4880 ft) to 2355 m (7730 ft). Soils are derived from basaltic magma resulting from several volcanic eruptions which have occurred at least every 2500 years, with the most recent being about 2200 years ago (Kuntz et al. 1983).

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Many of the more vegetated areas in the monument are separated from surrounding vegetated areas on the Snake River Plain by relatively barren lava flows up to five km wide. These flows make travel difficult and have led to little use by domestic livestock. Relatively little free water over most of the monument has also prevented significant use by domestic livestock, and limits mule deer use of the southern two-thirds of the monument during late summer (Griffith 1983). These factors, combined with the management protection afforded by the area's wilderness status, have resulted in little non-natural disturbance of the plant communities, and many areas appear to be in pristine condition. Due to this, vegetation on Carey Kipuka, an older, more developed island of vegetation surrounded by lava in the monument, has been used as a reference for climax vegetation (Tisdale et al. 1965). Range condition on environmentally similar sites throughout southern Idaho is based largely on a comparison of their vegetation with that of Carey Kipuka.

Because of the above factors, most of the vegetation within the monument appears to be in a climax or near-climax stage. However, due to a combination of young parent material and extremely harsh environmental conditions (e.g., high surface soil temperatures in summer and low available moisture), the vegetation in several areas of the monument is in relatively early stages of primary succession (Day 1985). It is thus difficult to classify with current climax plant community descriptions (e.g., habitat types) such as those of Hironaka et al. (1983). This project did not attempt to describe the vegetation of CRMO in terms of habitat types or the potential or climax plant communities of a given area. Rather, the vegetation types (e.g., present vegetation of an area) were used as the basis for a classification. Under the relatively harsh environmental condition of the monument, rates of secondary succession are quite slow, and knowledge of present vegetation is most useful for management purposes. The plant communities described and mapped in this paper are not

to be inferred to be discrete communities. In many cases, boundaries drawn between types were made along a continuous gradient between two communities.

METHODS

Field work was done during the summers of 1982 and 1983. A general reconnaissance of the monument was conducted during the 1982 field season and about 100 areas were sampled. Foliar cover by species and bare ground was estimated using six cover classes at each area using a 10 x 15-m plot.

During the fall, apparent vegetation types were delineated on clear mylar placed over 1:15000 scale color aerial photographs of the monument. Areas sampled during the 1982 field season were used to interpret the results. The resultant vegetation map was ground-truthed during the 1983 field season. Many of the boundaries delineated on the aerial photos had to be revised, as there were differences among many vegetation types that were not apparent in the photographs. Conversely, several color differences which appeared in the photos were not apparent in the actual vegetation; these boundaries were also revised. These color differences were usually due to shading, reflection, and soil color differences. An overflight of the monument in mid-June 1983 also helped identify vegetation types, especially in remote locations in the south end.

Vegetation types were delineated based on the most dominant and conspicuous species and on those species having high relative cover within an area. Types with significantly different life forms, and thus relatively easily separated, were delineated with a resolution of approximately two ha (five ac). Separation of those types that were not readily differentiated was done at a lower level of resolution. In those portions of CRMO north of the highway and accessible by road, these latter types were delineated if a vegetation type covered more than approximately four ha (10 ac). In remote areas, these types were delineated if they covered more than approximately 10 ha (25 ac).

The final vegetation map was corrected to a 1:24000 scale USGS topographic map of the monument using a zoom-transfer scope. The total area covered by each vegetation type was determined using an electronic digitizer.

A total of 26 vegetation types were identified and mapped. The common names for all plants listed are given in the appendix. In the descriptions that follow, standard abbreviations are used for certain common grasses and shrubs following their first mention. Nomenclature follows Hitchcock and Cronquist (1973) and Cronquist et al. (1977). Photographs of each of the types are contained in copies of the report on file in CRMO library.

DESCRIPTION OF VEGETATION TYPES

1. Cinder Gardens

A cinder surface and low total plant cover (generally less than five percent in mid-summer) separate this community from all others. It is dominated by *Eriogonum ovalifolium* var. *depressum*, which is conspicuous due to its persistent leaves. Species common into mid-July include *Phacelia hastata*, *Cryptantha interrupta*, *Aster canescens*, *Chaenactis douglasii*, *Lygodesmia spinosa*, and *Stephanomeria tenuifolia*. In June, when growing conditions are most favorable, *Mimulus nanus* and *Mimulus suksdorfii*, both annuals, and perennials *Allium simillimum* and *Lewisia rediviva* are common. Some areas of this type are devoid of higher plants due to extremely harsh conditions. In some cases (such as Sheep Trail Butte), these conditions apparently result from large-sized cinders which reduce available soil moisture. Disturbances on cinder areas which cause depressions in the surface (such as vehicle tracks) may actually enhance plant establishment, but often lead to unnatural plant patterns (Day 1985).

2. Low Density Lava Flows

These flows of a'a, pahoehoe, and block lava are generally the youngest in the monument and have relatively low plant cover. Shrubs provide less than five percent of the total cover and include *Chamaebatiaria millefolium* (Chmi), *Holodiscus* spp., *Philadelphus lewisii* and *Haplopappus nanus*. On more favorable microsites, *Purshia tridentata* (Putr) and *Leptodactylon pungens* are common. *Artemisia tridentata* (Artr) ssp. *vaseyana* is common in this type in southern portions of the monument. Common forbs include *Penstemon deustus*, *Cymopterus terebenthinus*, *Erigeron compositus*, *Eriogonum umbellatum*, *Cirsium* spp. *Stephanomeria tenuifolia* and *Potentilla glandulosa*. The most common grasses are *Poa sandbergii* (Posa) and *Sitanion hystrix* (Sihy).

3. Medium Density Lava Flows

These areas have higher vegetational cover than the above type (up to 15%), although species composition is quite similar. The shrubs Putr, *Holodiscus* spp., *Chrysothamnus nauseosus* (Chna), and Chmi are common along with Artr ssp. *vaseyana* which dominates some of these flows, especially in southern portions of the monument. The forbs common on the low density lava flows are also present here. The forbs of more developed communities adjacent to these medium density flows occur in this type in more favorable microsites. The grasses *Stipa thurberiana* (Stth) and *Oryzopsis hymenoides* are common along with Posa and Sihy.

4. Mountain Big Sagebrush/Bluebunch Wheatgrass

This vegetation type is widespread in the monument and is quite diverse in composition. The dominant shrub is Artr ssp. *vaseyana*. *Agropyron spicatum* (Agsp) is the dominant

grass. Putr is common throughout this type and in some areas occurs in higher densities than Artr ssp. *vaseyana*. North of the highway *Symphoricarpos oreophilus* (Syor) and *Amelanchier alnifolia* are common, especially in more mesic sites such as north-facing slopes and ravines. On these sites, *Agastache urticifolia* and *Helianthella uniflora* are common. *Melica bulbosa* occurs in the more mesic areas of this type, being confined to Little Cottonwood Canyon.

On many of the less favorable sites, such as rock outcrops, *Balsamorhiza sagittata* is common. At upper elevations in areas of high snow accumulation along leeward sides of ridges, *Ceanothus velutinus* and Syor form small dense stands. In little Cottonwood Canyon, where soils are more developed, *Chrysothamnus viscidiflorus* replaces Chna in this type. On many areas having a cinder substrate, *Cymopterus terebinthinus* forms a dense understory.

5. Mountain Big Sagebrush/Sandberg Bluegrass

This vegetation type occurs on less mesic or shallower soil sites than type number four. There is also generally more barren ground than in the latter type. Artr ssp. *vaseyana* and Posa dominate. *Chrysothamnus* spp., Putr, *Leptodactylon pungens*, *Eriogonum heracleoides*, *E. umbellatum*, *E. microthecum*, and *E. ovalifolium* are also common. Stth and Agsp are common on more favorable sites in this type.

6. Mountain Big Sagebrush/Needle Grass

This type occurs on sandy, often shallow soils, in southern portions of the monument. The dominant shrub is Artr ssp. *vaseyana*, and Putr is also common. *Eriogonum heracleoides* and *E. umbellatum* are common understory species. Common grasses include *Stipa comata*, Stth, X *Stiporyzopsis bloomeri* and *Oryzopsis humenoides*. Agsp is common in certain areas, and this leads to a mosaic effect. Areas where patches of Agsp were interspersed among larger areas dominated by *Stipa* spp. were included in this type.

7. Mountain Big Sagebrush/Needle-and-thread/Cheatgrass

This area is confined to a south-facing slope at the mouth of Little Cottonwood Canyon. Artr ssp. *vaseyana* dominates, and Putr is common. The dominant grasses are *Stipa comata* and *Bromus tectorum*, with the latter forming a dense stand over much of this type. It is not known if this type is seral, but it appears to be relatively stable.

8. Mountain Big Sagebrush/Idaho Fescue

This type covers north and northeast-facing slopes in Little Cottonwood Canyon and on Carey Kipuka. In the former area, it occurs adjacent to type number four. Artr ssp. *vaseyana* occurs in sporadic clumps and at lower densities in this type than in type 4. A relatively dense stand of

herbaceous vegetation is present between shrubs and is codominated by the grasses *Festuca idahoensis* (Feid) and *Koeleria nitida*. Common forbs are *Castilleja miniata* and *Lupinus argenteus*.

On Carey Kipuka, it should be noted, the dominant *Artemisia* is *A. tridentata* ssp. *tridentata*, apparently due to deeper soils (Hironaka et al. 1983). For simplicity, this area is classified in this type. Vegetation on Carey Kipuka has been described by Tisdale et al. (1965).

9. Big Sagebrush/Cheatgrass

This type is found on Carey Kipuka and appears to be a relatively stable seral stage of the Big Sagebrush/Idaho Fescue habitat type. Artr ssp. *tridentata* is the dominant shrub. *Bromus tectorum* occurs in a relatively dense stand and is interspersed with individuals of Feid, Agsp, and occasional forbs found in the above habitat type.

10. Complex of Types 4 and 8

This complex occurs in Little Cottonwood Canyon and contains all species common in both the Mountain Big Sagebrush/Bluebunch Wheatgrass and Mountain Big Sagebrush/Idaho Fescue types.

11. Three-tip Sagebrush/Idaho Fescue

This type occurs on relatively steep north-facing slopes in upper Little Cottonwood Canyon. *Artemisia tripartita* is the dominant shrub, but occurs in relatively low densities. Other woody species are generally lacking, with the exception of scattered individuals of *Tetradymia canescens* and *Eriogonum heracleoides*. Forbs include *Lupinus argenteus*, *Antennaria* sp., *Sedum stenopetalum* and *Phlox hoodii*. Common grasses include *Koeleria nitida*, Feid, and Posa.

12. Early Low Sagebrush/Idaho Fescue

This type is restricted to a small but distinct area on Carey Kipuka. The dominant shrub is *Artemisia longiloba*, which forms a relatively open stand. Common forbs include *Antennaria stenophyllus*, *Eriogonum caespitosum*, and *Phlox hoodii*. The dominant grass is Feid, while Stth is common.

13. Low Sagebrush/Sandberg Bluegrass

This type occurs on exposed, wind-swept ridges along Little Cottonwood Canyon. Total plant cover is less than 40%. Soils are shallow and gravelly. *Artemisia arbuscula* is the only shrub present in most areas. Common forbs include *Haplopappus acaulis*, *Phlox hoodii*, *Oxytropis lagopus*, *Eriogonum caespitosum*, and *Castilleja* spp. The dominant grass is Posa. At higher elevations *Leucopoa kingii* is also common.

At its lowest elevation in the monument, this type occupies an exposed ridge that has been covered by at least 0.5 m of cinders near Sunset Cone. Here it appears that the *Artemisia* present is a hybrid between *A. tripartita* and *A. arbuscula*.

14. Low Sagebrush/Idaho Fescue

This area occurs on sites similar to the above type but on finer textured and/or deeper soils. Posa is replaced by Feid in this type. Total cover is higher in this type than cover in type number 13, but species richness is similar.

15. Complex of Types 13 and 14

This type occurs on exposed ridges and is composed of mosaics of the Low Sagebrush/Sandberg Bluegrass and Low Sagebrush/Idaho Fescue types.

16. Antelope Bitterbrush

This type covers large areas of the younger cones. Generally, plant cover is greater than 50 percent, and the dominant shrub is a relatively low growing form of Putr. Chna and *Ribes cereum* are the other common shrubs. *Pinus flexilis* and Artr ssp. *vaseyana* are present as scattered individuals. Common forbs include *Delphinium andersonii*, *Eriogonum umbellatum*, *E. ovalifolium*, *Mimulus nanus*, and *Phacelia hastata*. The most common grasses are Sihy, Stth and Posa, with Agsp found on the more favorable sites.

17. Antelope Bitterbrush/Great Basin Wildrye

Found on slopes of medium-aged and older cinder cones, the dominant shrub in this type is Putr. Other common shrubs include Chna, Syor, and *Eriogonum heracleoides*. *Ribes cereum* and Artr ssp. *vaseyana* occur as scattered individuals. Common forbs include *Balsamorhiza sagittata*, *Arabis holboellii*, *Eriogonum umbellatum*, and *Lithospermum ruderales*. *Cymopterus terebinthinus* forms a relatively dense understory in much of this type, especially where grass density is low. The most conspicuous grass is *Elymus cinereus*, although Agsp occurs in much higher densities than *Elymus* in many areas of this type.

18. Bluebunch Wheatgrass/Idaho Fescue

This type occurs on limited areas on north-facing slopes at upper elevations in Little Cottonwood Canyon. These areas appear to be more mesic (due to snow accumulation) than adjacent areas which contain a shrub component. Forbs from both the Mountain Big Sagebrush/Bluebunch Wheatgrass and the Three-tip Sagebrush/Idaho Fescue types are present.

19. Bluebunch Wheatgrass/Sandberg Bluegrass

This type occurs on three older cones in the monument, Round Knoll, Two-Point Butte, and Coyote Butte. On the

first two, this type appears to be relatively stable with no signs of recent disturbance. This type was noted by Egger (1941) on Round Knoll. The shrubs are inconspicuous and are dominated by relatively low-growing species such as *Leptodactylon pungens* and *Eriogonum microthecum*. Artr ssp. *vaseyana* and Putr are infrequent. Forbs include *Chaenactis douglasii* and *Crepis acuminata*. Agsp and Posa are the most common grasses, along with lesser amounts of *Stipa comata*.

This type also occurs on Coyote Butte where it appears to be seral, due to signs of past disturbance from fire and the apparent invasion of young individuals of Artr ssp. *vaseyana*, Putr, and Chna. Common grasses include Agsp, Posa, and *Bromus tectorum*. Other grasses present include Sihy, Stth, and *Elymus cinereus*.

20. Great Basin Wildrye

This type occurs on alluvial fans where drainages enter the lava plains. *Elymus cinereus* is the dominant plant here and forms relatively dense stands. Artr ssp. *vaseyana* and Chna are occasional. Several weedy forbs are present between *Elymus* individuals, including *Mentzelia albicaulis*, *Capsella bursa-pastoris*, *Gayophytum decipiens*, and *Lappula redowskii*.

21. Limber Pine/Antelope Bitterbrush (Low Total Cover).

This area is composed of large, block type lava remnants interspersed with cinder gardens (such as Devil's Orchard). At more favorable microsites (such as around the edges of lava blocks where moisture accumulates), *Pinus flexilis* is common. The dominant shrub is Putr, and Chna, Chmi, Artr ssp. *vaseyana*, *Leptodactylon pungens*, and *Ribes cereum* are common. Common forbs include *Mimulus nanus*, *Gayophytum decipiens*, *Calyptidium roseum*, *Eriogonum umbellatum* and *E. ovalifolium*. Common grasses include Stth, Sihy, *Oryzopsis hymenoides*, and Posa. Cinder patches are dominated by plants typical of the cinder gardens.

22. Limber Pine/Antelope Bitterbrush (High Total Cover).

This type is found on young to medium-age cinder cones. Total vegetative cover is higher in these areas than the low cover type above, due to the absence of lava blocks. Putr is the dominant shrub and occurs in a relatively low form. Other common shrubs include Chna, and *Ribes cereum*. Artr ssp. *vaseyana* is common on more favorable sites where soils contain a significant buried epipedon within one meter of the surface. Common forbs include *Eriogonum umbellatum*, *E. ovalifolium*, *Mimulus nanus*, and *Gayophytum decipiens*. Grasses include Stth, Sihy, and Posa. Agsp is limited to more favorable microsites.

23. Limber Pine/Antelope Bitterbrush (High Density Limber Pine).

Relatively high densities of *Pinus flexilis* occur in this type on more favorable north-to-east-facing slopes of cinder

cones. Species richness is similar to the above type, although on older and/or more mesic sites, such as Silent Cone, *Pseudotsuga menziesii* is present, but less common than *Pinus flexilis*. On these sites the shrubs Syor and *Prunus virginiana* are common.

24. Douglas-fir/Mountain Snowberry

This type is found on relatively steep, north-facing slopes of older cinder cones and along Little Cottonwood Canyon. *Pseudotsuga menziesii* is the dominant tree, with occasional individuals of *Pinus flexilis* present. Generally, more than 50 percent of the soil surface is devoid of vegetation, but it is covered by a layer of litter. The dominant understory shrub is Syor. *Prunus virginiana* is common, especially in areas of higher light intensities. *Salix* spp. is also present, and common forbs include *Mertensia ciliata*, *Valeriana acutiloba* and *Potentilla glandulosa*. Common grasses present in this type include Posa, Feid, and *Agropyron trachycaulum*.

25. Upland Quaking Aspen

These areas occur on upland sites generally away from permanent stream courses. *Populus tremuloides* is the dominant tree species. The understory consists of scattered individuals of Syor and occasional individuals of *Salix* spp., along with a relatively dense layer of forbs and grasses. Common forbs include *Geranium viscosissimum*, *Castilleja miniata*, *Lupinus argenteus*, and *Aquilegia formosa*. Common grasses include *Poa pratensis*, *Agropyron trachycaulum*, *Stipa occidentalis* var. *nelsonii*, and Feid.

26. Riparian

This type is differentiated from the above type by its dense woody vegetation, close proximity to a permanent water-course, and the presence of a dense layer of tall forbs. The dominant tree species form a mosaic which consists of

patches of *Populus tremuloides*, *P. trichocarpa*, *Prunus virginiana*, *Salix* spp., *Alnus incana*, and *Betula glandulosa*. The latter three are more common at higher elevations. In the more mesic areas, a dense tall forb component is conspicuous and is dominated by *Heracleum lanatum*, *Urtica dioica*, and *Angelica pinnata*. *Rudbeckia occidentalis*, *Agastache urticifolia* and *Aquilegia formosa* are also common.

Table 1. The areas occupied by each vegetation type.

Vegetation type	Acres	Area Hectares	Percent
1	1195	484	2.2
2	30948	12525	57.8
3	5430	2196	10.1
4	2772	1122	5.2
5	6245	2527	11.7
6	778	315	1.5
7	5	2	<.01
8	242	98	.5
9	18	7	<.01
10	13	5	<.01
11	101	41	.2
12	1	0.4	<.01
13	311	126	.6
14	63	26	.1
15	38	15	.07
16	1178	477	2.2
17	211	85	.4
18	1	0.4	<.01
19	24	10	.04
20	21	9	.03
21	558	226	1.1
22	2995	1212	5.6
23	214	87	.4
24	72	29	.1
25	38	15	.07
26	73	30	.13
Total	53545	21670	100.

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APPENDIX I

SCIENTIFIC AND COMMON NAMES FOR ALL PLANTS LISTED

<i>Agastache urticifolia</i>	Nettle-leaf horsemint	<i>Helianthella uniflora</i>	oneflower helianthella
<i>Agropyron spicatum</i>	bluebunch wheatgrass	<i>Heracleum lanatum</i>	cow parsnip
<i>Agropyron trachycaulum</i>	slender wheatgrass	<i>Holodiscus</i> spp.	ocean spray
<i>Allium simillimum</i>	dwarf onion	<i>Koeleria nitida</i>	prairie junegrass
<i>Alnus incana</i>	mountain alder	<i>Lappula redowskii</i>	western stickseed
<i>Amelanchier alnifolia</i>	Saskatoon serviceberry	<i>Leptodactylon pungens</i>	lava phlox
<i>Angelica pinnata</i>	small-leaf angelica	<i>Leucopoa kingii</i>	spikegrass
<i>Antennaria stenophyllus</i>	narrow-leaf pussy-toes	<i>Lewisia rediviva</i>	bitterroot <i>Lewisia</i>
<i>Aquilegia formosa</i>	Sitka columbine	<i>Lithospermum ruderales</i>	stoneseed
<i>Arabis holboellii</i>	Holboell rockcress	<i>Lupinus argenteus</i>	silvery lupine
<i>Artemisia arbuscula</i>	low sagebrush	<i>Lygodesmia spinosa</i>	thorn skeleton plant
<i>A. longiloba</i>	early low sagebrush	<i>Melica bulbosa</i>	onion grass
<i>A. tridentata</i> ssp. <i>tridentata</i>	big sagebrush	<i>Mentzelia albicaulis</i>	whitestem mentzelia
<i>A. tridentata</i> ssp. <i>vaseyana</i>	mountain big sagebrush	<i>Mertensia ciliata</i>	broadleaf bluebell
<i>A. tripartita</i>	three-tip sagebrush	<i>Mimulus nanus</i>	dwarf monkeyflower
<i>A. tripartita</i> var. <i>rupicola</i>		<i>M. suksdorfii</i>	Suksdorf's mimulus
<i>Aster canescens</i>	hoary aster	<i>Oryzopsis hymenoides</i>	Indian ricegrass
<i>Balsamorhiza sagittata</i>	arrowleaf balsamroot	<i>Oxytropis lagopus</i>	rabbit-food crazyweed
<i>Betula glandulosa</i>	bog birch	<i>Penstemon deustus</i>	scabland penstemon
<i>Bromus tectorum</i>	cheatgrass	<i>Phacelia hastata</i>	silverleaf phacelia
<i>Calyptidium roseum</i>	rosy calyptidium	<i>Philadelphus lewisii</i>	mockorange
<i>Capsella bursa-pastoris</i>	shepherd's purse	<i>Phlox hoodii</i>	Hood's phlox
<i>Castilleja miniata</i>	scarlet painted-cup	<i>Pinus flexilis</i>	limber pine
<i>Ceanothus velutinus</i>	sticky laurel	<i>Poa pratensis</i>	Kentucky bluegrass
<i>Chaenactis douglasii</i>	Douglas chaenactis	<i>P. sandbergii</i>	Sandberg bluegrass
<i>Chamaebatiaria millefolium</i>	tansybush	<i>Populus tremuloides</i>	quaking aspen
<i>Chrysothamnus nauseosus</i>	rubber rabbitbrush	<i>P. trichocarpa</i>	black cottonwood
<i>C. viscidiflorus</i>	green rabbitbrush	<i>Potentilla glandulosa</i>	sticky cinquefoil
<i>Cirsium</i> spp.	thistle	<i>Prunus virginiana</i>	common chokecherry
<i>Crepis acuminata</i>	taper-tip hawksbeard	<i>Pseudotsuga menziesii</i>	Douglas-fir
<i>Cryptantha interrupta</i>	bristly cryptantha	<i>Purshia tridentata</i>	antelope bitterbrush
<i>Cymopterus terebinthinus</i>	desert parsley	<i>Ribes cereum</i>	wax current
<i>Delphinium andersonii</i>	Anderson larkspur	<i>Rudbeckia occidentalis</i>	blackhead coneflower
<i>Elymus cinereus</i>	great basin wildrye	<i>Salix</i> spp.	willow
<i>Erigeron compositus</i>	fernleaf fleabane	<i>Sedum stenopetalum</i>	stonecrop
<i>Eriogonum caespitosum</i>	mat eriogonum	<i>Sitanion hystrix</i>	squirrel tail
<i>E. heracleoides</i>	Wyeth eriogonum	<i>Stephanomeria tenuifolia</i>	narrowlved. skeletonweed
<i>E. microthecum</i>	slenderbrush eriogonum	<i>Stipa occidentalis</i> var. <i>nelsonii</i>	Nelson's needlegrass
<i>E. ovalifolium</i> var. <i>depressum</i>	dwarf buckwheat	<i>S. comata</i>	needle-and-thread
<i>E. umbellatum</i>	sulfur buckwheat	<i>S. thurberiana</i>	Thurber needlegrass
<i>Festuca idahoensis</i>	Idaho fescue	<i>X Stiporyzopsis bloomeri</i>	
<i>Gayophytum decipiens</i>	deceptive groundsmoke	<i>Symphoricarpos oreophilus</i>	mountain snowberry
<i>Geranium viscosissimum</i>	sticky purple geranium	<i>Tetradymia canescens</i>	gray horsebrush
<i>Haplopappus nanus</i>	dwarf goldenweed	<i>Urtica dioica</i>	bigsting nettle
<i>H. acaulis</i>	stemless goldenweed	<i>Valeriana acutiloba</i>	sharpleaf valerian